



CHAPTER 12

NATURAL HAZARDS

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TABLE OF CONTENTS

4

Goals and Objectives

4

Goal 1: Mitigate the Effects of Natural Hazards to Achieve Coastal Resiliency, Protect Public Safety, and Reduce Economic Loss

6

Goal 2: Complete a Post Disaster Recovery and Reconstruction Plan

7

Goal 3: Provide Education to the Public Relating to Natural Hazards

See next page for list of tables and figures.

CHAPTER 12 | NATURAL HAZARDS

Figures

12.1 | Special Flood Hazard Area for
Southold Town





12 | NATURAL HAZARDS

Natural hazards are natural events that threaten lives and property, and tend to occur repeatedly in the same geographical locations. They can often be predicted because they are related to the weather patterns and/or physical characteristics of an area. Southold Town is subject to natural hazards that can imperil human lives, property, and the environment. Within the last century, the Town has witnessed significant weather-related occurrences including numerous hurricanes, tropical storms, severe thunderstorms, and nor'easters. The hazards from these storms include flooding, wind damage, shoreline erosion, and tornados. Other natural hazards that occur, and are predicted to re-occur, are drought and extreme temperatures. Below is a list of natural hazards for Southold Town. Planning and preparing for natural hazards can and will help save lives and property.

Natural hazards for Southold Town:

- Flooding (coastal, riverine, flash, urban)
- Nor'easters (extra tropical cyclones, including severe winter low-pressure systems)
- Severe Winter Storms (heavy snow, blizzards, ice storms)
- Coastal Erosion
- Severe Storms (windstorms, thunderstorms, hail, tornados)
- Hurricanes (tropical cyclones, tropical storms, tropical depressions)
- Sea Level Rise
- Drought
- Extreme Temperature (heat wave or cold temperatures)
- Wildfire

Severe storms, severe winter storms, and nor'easters are noted as high risks for Suffolk County, and are predicted to occur frequently in Southold Town, according to the County's hazard mitigation plan.¹

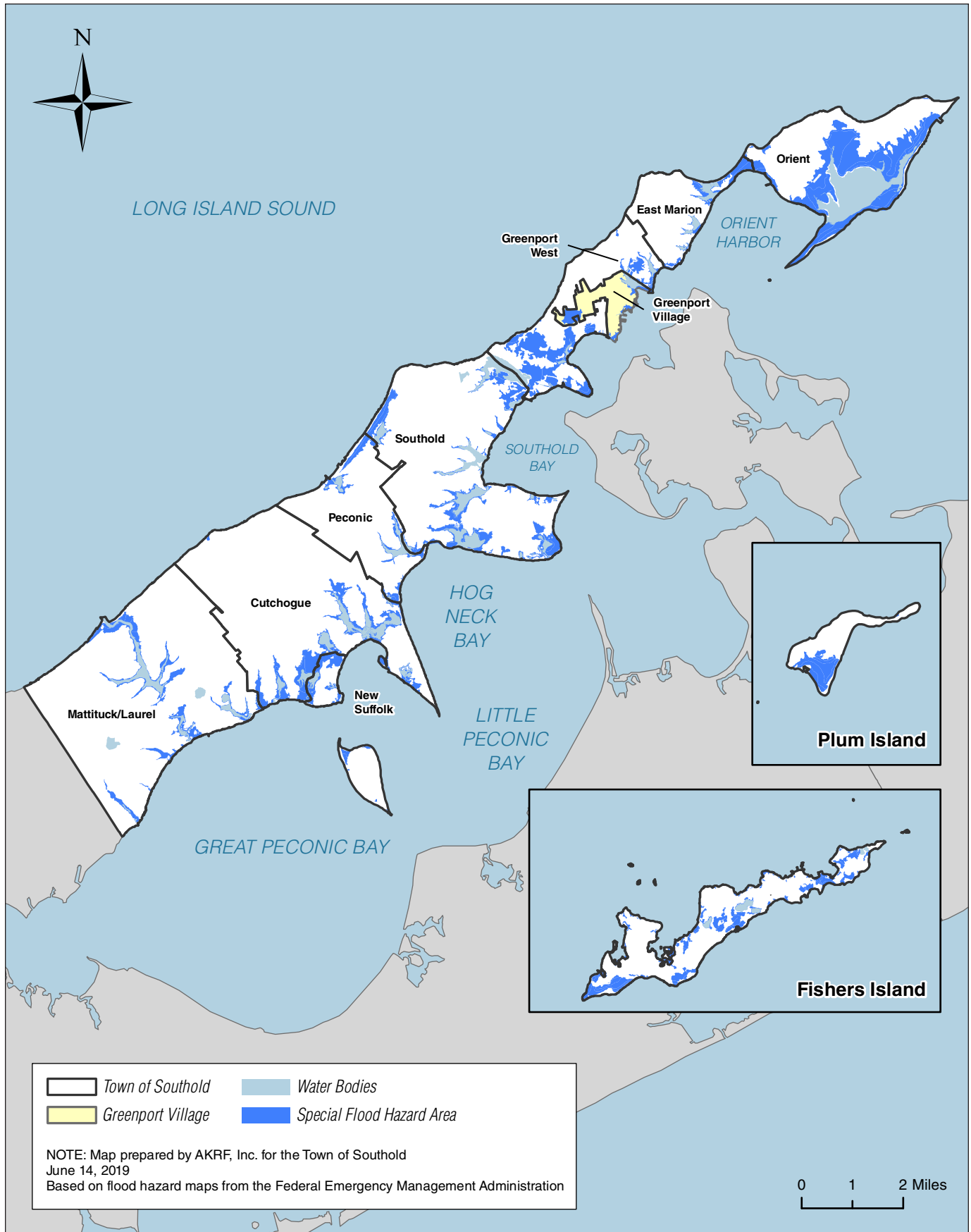
The National Flood Insurance Program is predicting an increase in flooding frequency; as strong storms occur more often, coastal inundation will be more frequent, and sea levels will continue to rise. With 210 miles of shoreline, and over 1,100 homes and many businesses located in the flood zone, Southold Town is vulnerable to coastal flooding.



Over time, sea level rise will contribute to worsening coastal flooding and related hazards such as salt-water intrusion into groundwater areas currently used for drinking water. According to measurement data from the National Oceanic and Atmospheric Administration (NOAA), sea level has risen about two inches in the Long Island area over the past 20 years (1993–2013). In the next 20 years, the rate of sea level rise is predicted to increase due to the warming of the oceans (water expands as it warms) and due to ice melt from the polar region. Studies project that Long Island will experience a two- to five-inch additional rise in sea level in the 2020's. If the rate continues to increase, however, the actual sea level rise in the 2020's could reach as high as 10 inches.² This will result in more homes and infrastructure being vulnerable to the effects of future storms.

¹ Suffolk County Multi-Jurisdictional Multi-Hazard Mitigation Plan, 2007.

² Climate Adaptation Guidebook for New York State, 2011.

Figure 12.1 Special Flood Hazard Area for Southold Town

The following link provides more information about sea level rise: <https://sealevelrise.org/>. To view the potential effects of sea level rise for Southold, click on the following link: <https://maps.coastalresilience.org/newyork/>.

To minimize potential damage to structures in vulnerable areas, the National Flood Insurance Program identified those areas most vulnerable to flooding. These areas are collectively known as the Special Flood Hazard Area and are predicted to have a one percent likelihood of flooding in any given year (see **Figure 12.1**). The Special Flood Hazard Area is also the area likely to flood during a 6- to 8-inch storm surge (as was experienced in Southold during Hurricane Sandy in 2012). Flooding can also occur beyond the Flood Hazard Area during storms that are more powerful. Another online resource for modeling coastal flooding that residents can use to see their potential vulnerability to flooding from different-sized storm surges and sea level rise is located at the following web address: <https://floodiq.com/>.

Coastal flooding causes erosion, which is another significant natural hazard for Southold. Erosion of the shoreline can also be caused by the normal processes of wind, currents, and wave action. Coastal erosion leads to loss of property and structures, and potentially hazardous conditions for waterfront landowners. There are areas in Southold Town that experience significant erosion problems, and steps need to be taken to deal with this issue.



Eroding bluff between Town Beach and Horton Point

In addition to the increasing frequency of severe storms and related flooding, the 2011 ClimAid report from the New York State Energy Research and Development Authority (NYSERDA) also predicts increases in extreme heat events (heat waves) and droughts for Long Island. Extreme heat and drought can cause loss of human life, damage and loss of agricultural crops and landscaping,

and reduction in the quantity and quality of drinking water. Hot, dry weather can also lead to wildfire, another potential natural hazard.

Local government is charged with responding immediately before and after natural disasters to protect its citizens. Government has a shared responsibility with its constituents to plan and manage emergency resources. All Southold residents and visitors are encouraged to take personal responsibility for their own preparedness before an emergency is imminent. To fulfill its share of the responsibility for emergency planning, the Town produced a plan for responding to coastal storms.

The Town of Southold Hurricane/Coastal Storm Emergency Response Plan (herein noted as the Emergency Response Plan) was adopted by the Southold Town Board in 1995 and serves as a template to guide the Town's efforts to prepare and respond to weather-related emergencies. This plan was prepared with the assistance of the Suffolk County Department of Fire, Rescue and Emergency Services and the New York State Emergency Management Office. The plan defines the Town's role in and responsibility for emergency response to hurricanes and other coastal storms in order to save lives and reduce injuries. The Emergency Response Plan includes information about the location of emergency shelters, evacuation procedures, and other protective measures. It also establishes protocols enabling the Supervisor to declare a "State of Emergency."

To implement the Emergency Response Plan, the Town has designated an Emergency Preparedness Team serving as the Southold Town Office of Emergency Management. This team consists of a diverse membership of employees from the Town, Fire Departments, Greenport Village, and Fishers Island. They are responsible for preparing for, responding to, and managing the immediate impacts from natural hazards, and have successfully done so since their inception.

Emergency response is only one part of planning for natural hazards. Hazard mitigation and post disaster recovery and reconstruction are the other main areas of natural hazard planning. Hazard mitigation planning was updated for Southold in 2014 when the U.S. Federal Emergency Management Agency (FEMA) accepted the Suffolk County Multi-Jurisdictional Multi-Hazard Mitigation Plan. Southold participated in this plan along with most of the towns and villages in Suffolk County. The plan identifies hazards, assesses the risk from those hazards, and lists mitigation efforts for

the County and each town. This mitigation plan must be updated every five years.

Post-disaster issues, at least short term, are discussed in the Town's Emergency Response Plan; however, the Town needs to take a more comprehensive and long-term approach to post-disaster recovery planning. Preparing for a potentially devastating storm is prudent, and one of the objectives in this chapter includes a recommendation for creating such a plan.

Planning for natural hazards relates to several of the other chapters in this Comprehensive Plan. Building coastal resiliency into the Town's plan will help the economy, make housing safer, and protect future investments in property, both private and public. For these reasons, Chapter 6, "Natural Resources & Environment," and Chapter 3, "Land Use & Zoning," both contain significant references to planning for natural hazards and contain similar and additional goals to those put forth in this chapter.

GOALS AND OBJECTIVES

☉ Goal 1: Mitigate the Effects of Natural Hazards to Achieve Coastal Resiliency, Protect Public Safety, and Reduce Economic Loss

The Town faces numerous hazards that are likely to occur, including severe storms, nor'easters, and hurricanes. Mitigation involves taking steps to ensure those hazards will not cause injury or death to people, and to reduce economic loss to structures and other property. As mentioned above, the Town has a hazard mitigation plan that can be found within the County's Multi-Jurisdictional All-Hazard Mitigation Plan (Hazard Mitigation Plan).

The Hazard Mitigation Plan contains a profile of Suffolk County and Southold Town, identifies the potential hazards, assesses the risk of the hazards, and proposes ways to reduce the impacts from the hazards (mitigation). This plan can be found online at the following web address: <https://fres.suffolkcountyny.gov/RESPOND/ApprovedPlan2014.aspx>.

Coastal resiliency is a term used to describe a place's ability to withstand coastal hazards such as sea level rise and flooding while minimizing threats to human life and property. The Hazard Mitigation Plan can be considered part of the Town's coastal resiliency plan. An excerpt from the plan with the Hazard Mitigation Measures for Southold Town is included as **Appendix 9**.

☉ Objective 1.1

Prepare a coastal resilience plan for Southold Town.

Working toward a town that is more resilient to coastal hazards will require a multi-step approach that results in changes to policies and regulations. Southold Town has already taken steps to become more resilient to coastal natural hazards such as flooding and erosion from storms and sea level rise through existing regulations relating to flood zones, wetlands, and building codes. These and additional regulations from other levels of government need to be assessed for their effectiveness in mitigating the effects of coastal hazards.

In addition to this chapter, this plan contains goals and objectives in other chapters that will lead towards coastal resiliency, including Chapter 6, "Natural Resources & Environment," and Chapter 3, "Land Use & Zoning." Existing plans such as the County's Hazard Mitigation Plan also have a role to play in our coastal resiliency plan.

After assessing existing tools and plans, data and models from the most reliable sources will be used to formulate a rational plan for improving our coastal resiliency wherever feasible. Sources for data and models related to sea level rise and flooding include NOAA, FEMA, and New York State, as well as academic institutions. Models such as interactive maps showing the land that sea level rise is predicted to affect are available from several sources right now, and will become more accurate over time.

Examples of sea level rise models can be viewed at the following websites:

- NOAA's Sea Level Rise and Coastal Flooding Impacts interactive map: <https://coast.noaa.gov/slr/>
- Coastal Resilience.org website's Future Scenarios Map: <https://maps.coastalresilience.org/newyork/>

A | Audit Southold's existing regulations related to coastal resilience.

B | Identify the best models for sea level rise.

➤ **Responsible Parties:** Planning Board

➤ **Possible Partnerships:** Emergency Preparedness Team, Office of the Town Engineer, Suffolk County, New York State

➤ **Possible Funding Sources:** New York State Hazard Mitigation Grant, New York State Department of State Environmental Protection Fund Grant

🎯 Objective 1.2

Continue to participate in the updates to Southold's hazard mitigation plan in cooperation with Suffolk County and the Suffolk County Multi-Jurisdictional All-Hazard Mitigation Plan.

This plan was updated in 2013 and approved by FEMA in 2014. FEMA requires this plan be updated every five years. A current mitigation plan is important for a community to remain eligible for hazard mitigation grant funds that can help implement the mitigation measures.

A | Add "extreme temperatures" as a significant hazard.

Extreme temperatures are identified as a hazard for Suffolk County, but the risk of extreme temperatures causing widespread problems was not considered significant in the Hazard Mitigation Plan. Recent studies predict an increase in the future occurrence of extreme temperatures, which suggests we must consider how we might mitigate the effects of this hazard.

B | Identify mitigation measures that have already been accomplished and remove them from the plan.

C | Identify new mitigation measures and add them to the plan, including the following:

- Measures that address agricultural land/crops at risk from flooding, drought, and storms.
- Measures that address the increased pollution and health hazards from flooding due to storms, as well as water inundation due to sea level rise. These measures include flooded sewer and septic systems, oil tanks, and drinking water wells.

- **Responsible Parties:** Emergency Preparedness Team
- **Possible Partnerships:** Southold Planning Board and Planning Department, Southold Town Trustees, Village of Greenport, Natural Resources Conservation Service

🎯 Objective 1.3

Implement the recommendations for hazard mitigation for Southold in the Suffolk County Multi-Jurisdictional All-Hazard Mitigation Plan.

The current mitigation plan includes data and analyses for individual towns. Southold's portion of the plan includes a history of the occurrence of natural hazards, an analysis of its future vulnerability to those hazards, and a list of hazard mitigation measures.

Southold has a list of mitigation measures in the current plan, some of which have been completed, and some of which are outdated or inconsistent with the Town's current goals. This plan can be found online at the following web address: <https://fres.suffolkcountyny.gov/RESPOND/ApprovedPlan2014.aspx>.

Those measures include retrofitting evacuation routes from flood hazard areas, considering the relocation or elevation of structures in the floodplain, and stabilizing vulnerable bluffs (see **Appendix 9** for a list of the mitigation measures).



Flooding from Hurricane Sandy in Southold

- A |** Prioritize the mitigation measures.
- B |** Identify funding sources to implement mitigation measures.
- C |** Identify partnerships and areas of cooperation with adjacent municipalities including Greenport Village, Riverhead, and Shelter Island.

- **Responsible Parties:** Planning Board, Planning Department
- **Possible Partnerships:** Emergency Preparedness Team, Office of the Town Engineer, Suffolk County, New York State, Village of Greenport, Southold Town Trustees, Town of Riverhead, Town of Shelter Island

🎯 Objective 1.4

Re-examine the location of the Coastal Erosion Hazard Area line.

In 1991, the Town of Southold enacted the "Town of Southold Coastal Erosion Hazard Area Law" to allow the Town to assume the responsibility, authority, and administration of the Coastal Erosion Management Program established pursuant to Article 34 of the New York State Environmental Conservation Law. The law regulates activities in an area called the Coastal Erosion Hazard Area (CEHA). This area is located along the shoreline where coastal erosion is most likely to occur. Development within the CEHA is generally prohibited due to the risk of erosion.

The line identifying the location of the CEHA (known as the "CEHA line") was mapped by the New York State Department of Environmental Conservation (NYSDEC) in the late 1980s. Since enactment of the law, shorelines have changed due to erosion caused by wave velocity and adverse weather conditions caused by storm events. Correspondingly, severe erosion and structural loss has been documented along the Peconic Bays, on Fishers Island, and on other shorelines in areas not included in the mapped CEHAs.

It is recommended that the Town work with NYSDEC to re-assess the accuracy of the existing CEHAs, as well as the designation's applicability to additional areas along the Great Peconic Bay and Little Peconic Bay shorelines that are not currently mapped as CEHAs.

- **Responsible Parties:** Planning Board
- **Possible Partnerships:** New York State Department of Environmental Conservation

🎯 Objective 1.5

Update the Town of Southold Hurricane/Coastal Storm Emergency Response Plan.

The Town's Emergency Response Plan reflects the Town's efforts to expediently and effectively respond to natural hazard emergencies. This document serves as a valuable resource in assisting personnel responsible for preparing

and responding to the damages of natural hazards. The existing plan requires periodic updating to reflect changes in personnel, technology, and resources.

- A | Update the plan to include the latest shelter locations and resources provided at those shelters.
- B | Consider how best to inform residents ahead of time that their house is in a flood zone, and that they may be subject to future evacuations, or that their location is at risk of being isolated during a flooding event (example: Orient Causeway flooding).
- C | Provide Spanish-speaking volunteers at shelters.
- **Responsible Parties:** Emergency Preparedness Team
- **Possible Partnerships:** Suffolk County Department of Fire, Rescue and Emergency Services, New York State Emergency Management Office

🎯 Goal 2: Complete a Post Disaster Recovery and Reconstruction Plan

Because odds are that natural disasters will occur in Southold, the Town needs to plan for long-term recovery and reconstruction. Depending on the extent of the disaster, this phase can go far beyond the time frame and activities covered by the Emergency Response Plan. According to guidelines published by FEMA together with the American Planning Association,³ this is "a plan for managing post-disaster recovery and reconstruction. Such a plan provides descriptions that include, but are not limited to, lines of authority, interagency and intergovernmental coordination measures, processes for expedited review, permitting, and inspection of repair and reconstruction of buildings and structures damaged by natural disasters."

The post-disaster plan differs from the emergency response plan in that it focuses on the long-term recovery efforts that must occur beyond the emergency preparedness and response functions of government just before, during, and immediately after an emergency event. The average timeline for emergency response efforts is three days, while recovery and reconstruction can go on for weeks, months, or even years.

🎯 Objective 2.1

Consider creating a Recovery and Reconstruction Ordinance in the Town Code.

³ Planning for Post-Disaster Recovery and Reconstruction. 1998. Planning Advisory Service Report Number 483/484. Schwab, et. al.

A Recovery and Reconstruction Ordinance is an action a community can take to better manage disaster recovery. This is an ordinance the Town would have in place to establish a set of rules and an operational organization to deal with the aftermath and long-term recovery from a major disaster.

Recovery and reconstruction ordinances typically create a recovery organization and authorize a variety of pre- and post-event planning and regulatory powers and procedures related to disaster recovery and reconstruction. This organization would operate parallel to and in cooperation with emergency operations, typically continue beyond the typical time frame of emergency operations, and deal with issues such as planning and building that are outside the purview of typical emergency operations.

Some examples of areas a Recovery and Reconstruction Ordinance might cover include the following:

- A** | Create temporary regulations dealing with debris hazard abatement, temporary use and repair permits, handling non-conforming uses, and permit fee waivers.
- B** | Emergency Contractor Certification. A system would be set up to help vet and establish the legitimacy of the flood of contractors that typically flows to regions experiencing a disaster.
- C** | Create a recovery management organization that lasts into the long-term recovery phase and helps direct the preparation of recovery plans as well as helping to implement those plans.

This organization or team is created by putting together an interdisciplinary team of staff and officials involving all aspects of town government, including Building, Information Technology, Geographic Information Systems, Planning, Engineers, Human Services, Public Works, Highway Department, Accounting and any others that might be able to help the effort.

- D** | Create a template Recovery Plan to be ready for details to be added depending on the type of disaster that occurs.

- E** | Coordinate debris removal from private property.
 - F** | Outline public participation in recovery planning.
 - G** | Create a framework to coordinate donations and distribution of supplies to affected residents.
- **Responsible Parties:** Planning Board, Planning Department
 - **Possible Partnerships:** Emergency Preparedness Team, Southold Town Trustees, Southold Town Departments including Building, Public Works, Highway, Community Development, Human Resources, and any other departments that might be involved in reconstruction and recovery, Village of Greenport, Riverhead, Shelter Island, Suffolk County

🎯 **Goal 3: Provide Education to the Public Relating to Natural Hazards**

🎯 **Objective 3.1**

Create an easy-to-read plan for residents and visitors that clearly describes what to do in the event of natural hazard emergencies.

🎯 **Objective 3.2**

Use social media as a tool to inform residents and visitors of natural disasters, including how to prepare ahead of time, what to do when a predicted natural disaster is imminent or occurring, and how to deal with the aftermath.

🎯 **Objective 3.3**

Add links to the Town website with flood zone information, maps, and visual representations of flooding scenarios.

- **Responsible Parties:** Planning Board
- **Possible Partnerships:** Emergency Preparedness Team, Information Technology

